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EXAMINER	
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ART UNIT	**PAPER NUMBER**
1651	

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/618,540	LIM, SAI KIANG	
	Examiner	Art Unit	
	Lora E. Barnhart	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 13-19* is/are pending in the application.

4a) Of the above claim(s) *5-11,13-17 and 19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/24/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-11 and 13-19 are pending; claims 1-4 and 18 are currently under consideration.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/24/06 has been entered.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action. Prior art references can be found in a prior Office action, unless otherwise noted.

Election/Restrictions

The restriction requirement remains FINAL. Rejoinder considerations will be made only at such time as an allowable claim is present in the case.

Double Patenting

Claims 1-4 remain rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-3 of copending Application No. 10/521071.

Instant claim 1 is drawn to a population of cells that has four specific properties; claim 1 of the '071 application is drawn to a population of cells with the same four properties. Instant claim 2 and claim 2 of the '071 application both require that the cells

express a particular set of markers. Instant claims 3 and 4 and claim 2 of the '071 application require that the cells be human.

This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

The examiner notes applicant's assertion that "there [will be] no unjustified extension of patent exclusivity beyond the term of patent(s) that may issue" (Remarks, page 6, section III), but notes that the claims still require a rejection under section 101 as detailed above.

Claim 18 remains provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of copending Application No. 10/521071.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of instant claim 18 is completely encompassed by the scope of claims 1-3 of the '071 application. Instant claim 18 requires that the cells of claim 1, which are identical to the cells of claim 1 of the '071 application as claimed, be from a single clone. Because the '071 claims do not limit the source of cells, they therefore encompass cells obtained from any source that meet all the limitations of said claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The examiner notes applicant's assertion that "there [will be] no unjustified extension of patent exclusivity beyond the term of patent(s) that may issue" (Remarks,

page 6, section III), but notes that the claims still require an obviousness-type double patenting rejection as detailed above.

Claim Rejections - 35 USC § 112

Claims 1-4 and 18 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The invention appears to employ novel biological materials, specifically HuSH cells (Example 3, page 37 line 29). Since the biological materials are essential to the claimed invention, they must be obtainable by a repeatable method set forth in the specification or otherwise readily available to the public. If the biological materials are not so obtainable or available, a deposit of the biological materials may satisfy the requirements of 35 U.S.C. § 112.

The specification does not disclose a repeatable process to obtain the biological materials, and it is not apparent if the biological materials are readily available to the public. Applicant does not seem to have deposited the biological materials, and there is no indication in the specification as to public availability. If the deposit is made under the Budapest Treaty, then an affidavit or declaration by Applicant, or a statement by an attorney of record over his or her signature and registration number, stating that the specific biological materials have been deposited under the Budapest Treaty and that the biological materials will be irrevocably and without restriction or condition released to the public upon the issuance of a patent, would satisfy the deposit requirement made herein.

If the deposit has not been made under the Budapest Treaty, then in order to certify that the deposit meets the criteria set forth in 37 C.F.R. §§ 1.801-1.809, Applicant may provide assurance of compliance by an affidavit or declaration, or by a statement by an attorney of record over his or her signature and registration number, showing that:

(a) during the pendency of this application, access to the invention will be afforded to the Commissioner upon request;

(b) all restrictions upon availability to the public will be irrevocably removed upon granting of the patent;

(c) the deposit must be maintained in a public depository for a period of 30 years or 5 years after the last request or for the effective life of the patent, whichever is longer;

(d) a test of the viability of the biological material at the time of deposit will be made (see 37 C.F.R. §1.807) and

(e) the deposit will be replaced if it should ever become inviable.

Applicant's attention is directed to M.P.E.P. § 2400 in general, and specifically to § 2411.05, as well as to 37 C.F.R. § 1.809(d), wherein it is set forth that "the specification shall contain the accession number for the deposit, the date of the deposit, the name and address of the depository, and a description of the deposited material sufficient to specifically identify it and to permit examination." The specification should be amended to include this information; however, Applicant is cautioned to avoid entry of new matter into the specification by adding any other information.

Finally, Applicant is advised that the address for the ATCC has recently changed, and that the new address should appear in the specification. The new address is:

American Type Culture Collection
10801 University Boulevard
Manassas, VA 20110-2209

It is noted that this rejection has previously been made and withdrawn, but upon further consideration, the examiner has determined that the person of ordinary skill in the art would require undue experimentation to make the claimed cell population. The specification at page 29, lines 3-26, details the culturing process required to obtain the populations of the invention. According to the specification, culturing the cells of the invention from "older embryos" was "complex, with many different cell types and derivation of RoSH lines required extensive subculturing." Applicant cited M.P.E.P. § 2164.06(a) and *Ex parte Jackson* in particular in the reply received 9/29/05, but this case is not the only relevant piece of case law in deposit situations.

According to M.P.E.P. § 2404.02, no deposit is required where the required biological materials can be obtained from publicly available material with only routine experimentation and a reliable screening test. *Tabuchi v. Nubel*, 559 F.2d 1183, 194 USPQ 521 (CCPA 1977); *Ex Parte Hata*, 6 USPQ2d 1652 (Bd. Pat. App. & Int. 1987). In this case, applicants have provided no reliable screening test, but rather describe the cells as having a "fibroblastic morphology" (page 29, line 32), as being "ring-like" (page 37, line 32), and forming "a meshwork of cord-like structures at high confluency on gelatin-coated plates" (page 38, lines 1-2). These imprecise descriptions of the morphology of the cells cannot be considered a "reliable screening test." Considering the emergent nature of the art and the unpredictability of primary cell and stem cell

cultures in light of the limited direction applicants provide, a deposit in this case is clearly required.

It is noted that at page 30, lines 18-24, the specification refers to a deposit of RoSH cells at the ATCC. A submission of an affidavit or declaration, or a statement by an attorney of record over his or her signature and registration number, stating that the biological materials will be irrevocably and without restriction or condition released to the public upon the issuance of a patent, will overcome this ground of rejection for mouse cells isolated from embryos only. In order to overcome this ground of rejection across its entire scope, applicant should deposit the additional cell lines (Ro(BM)SH, HuSH, and PoSH) **and** make a statement as above **or** make a statement as above **and** amend the claims such that they are limited to cells isolated from mouse embryos. Applicant should note M.P.E.P. § 2406.02, which requires a corroborative statement from a skilled artisan for a deposit made after the filing date of the application.

The rejections of record under section 112, second paragraph, are withdrawn in light of the claim amendments.

Claims 1-4 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is drawn to a population of cells that has four particular properties (designated (i)-(iv) in claim 1). It is not clear whether each and every cell within the population has all of these properties, or whether the population as a whole represents a heterogeneous group of cells, some of which have property (i), some of which have

property (ii), some of which have property (iii), and some of which have property (iv). Clarification is required.

Because claims 2-4 and 18 depend from indefinite claim 1 and do not clarify the point of confusion, they must also be rejected under 35 U.S.C. 112, second paragraph.

Claim 2 is drawn to a populations of cells that "do not express" several markers. Again, it is not clear whether none of the cells express any of the seven recited markers, or whether at least some of the cells do not express each of the seven. Clarification is required.

In the interest of compact prosecution, the claims have been interpreted broadly, *i.e.*, to a population wherein at least some of the cells have each of the four properties and wherein the cells do not express at least one of the seven markers.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 and 18 remain rejected under 35 U.S.C. 102(b) as being anticipated by Hughes et al. (in *Methods in Bone Marrow Biology*, 1998; Chapman & Hall; reference U) taken in light of Rafii et al. The claims are drawn to a composition comprising

mammalian cells that give rise to both hematopoietic and endothelial lineages, said composition comprising cells that have at least one of four properties as recited in claim 1. In some dependent claims, the cells do not react with at least one of seven recited markers. In some dependent claims, the cells are human. In some dependent claims, the cells are from a single clone.

Hughes et al. teach that isolating bone marrow from humans was well known in the art at the time the invention was made (page 20, paragraph 2). Hughes et al. detail a protocol for isolating bone marrow from rats (page 21) and point out that isolating bone marrow from humans is accomplished in a similar manner (page 22, paragraph 2).

Rafii et al. teach that bone marrow naturally comprises both endothelial precursor cells (EPCs) and hematopoietic stem cells (HSCs) (see, for example, Table 1). The isolated bone marrow preparation of Hughes et al. therefore inherently differentiates to both hematopoietic and endothelial cell lineages. Bone marrow, and indeed the entire human body, arises from a single cell (the fertilized egg) and, as such, can be considered to be "cultured from a single clone" as required by claim 18.

It should be noted that the citation of Hughes et al. in this rejection does not cause this rejection to be a new ground of rejection; Hughes et al. has been supplied herein only as directly corresponding evidence that isolating bone marrow from humans was well known in the art at the time of the invention. No new issues are introduced by the inclusion of Hughes et al. in this rejection. See M.P.E.P. § 2144.03(D).

This rejection is made over Hughes et al. **in light of** Rafii et al., not over Rafii et al. *per se*. The Rafii et al. reference was merely cited as evidence of inherent

characteristics of a prior art product, in this case the purified human bone marrow of Hughes et al. In certain circumstances, references cited to show a universal fact need not be available as prior art before applicant's filing date. *In re Wilson*, 311 F.2d 266, 135 USPQ 442 (CCPA 1962). Such facts include the characteristics and properties of a material or a scientific truism. See M.P.E.P. §2124.

Applicant alleges that the instant claims are not drawn to bone marrow (Remarks, page 7, section IV, paragraph 3). Applicant further alleges that "nothing in Rafii suggests that [the cells of Rafii] have the characteristics of the cell preparation as claimed...There is no description in Rafii of the cells' behavior in culture" (*ibid.*). Applicant further alleges that Rafii expresses uncertainty about the identifying characteristics of bone marrow cells (Remarks, page 8, paragraph 1). These arguments have been fully considered, but they are not persuasive.

Applicant alleges that the claims are not drawn to bone marrow, but the examiner points out that according to Rafii et al., the bone marrow of Hughes et al. inherently comprises cells that give rise to both hematopoietic and endothelial cells; indeed, this inherent property of bone marrow is the basis for this rejection. The instant claims do not require that each and every cell of the claimed preparation be able to yield both hematopoietic and endothelial cells, only that the preparation as a whole have this ability. Bone marrow indeed inherently possesses this ability. The bone marrow of Hughes et al., then, is a purified preparation of mammalian cells that, according to Rafii et al., has at least one of the four properties required in instant claim 1; the examiner maintains that in light of the specification, the person of ordinary skill in the art would

have a reasonable expectation that said bone marrow possesses all four properties, in the absence of substantive evidence to the contrary.

Whether the purified bone marrow of Hughes et al. was known before the instant invention to possess these four properties is immaterial on its own to the patentability of the composition. To invalidate a patent by anticipation, a prior art reference normally needs to disclose each and every limitation of the claim. See *Standard Havens Prods., Inc. v. Gencor Indus., Inc.*, 953 F.2d 1360, 1369, 21 USPQ2d 1321, 1328 (Fed. Cir. 1991). However, a prior art reference (*i.e.*, the presence of bone marrow) may anticipate when the claim limitation or limitations not expressly found in that reference are nonetheless inherent in it. See *id.* and *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 630, 2 USPQ2d 1051,1053 (Fed. Cir. 1987). Under the principles of inherency, if the prior art necessarily functions in accordance with, or includes, the claimed limitations, it anticipates. See *In re King*, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986). **Inherency is not necessarily coterminous with the knowledge of those of ordinary skill in the art.** See *Titanium Metals*, 778 F.2d at 780. Artisans of ordinary skill may not recognize the inherent characteristics or functioning of the prior art. See *id.* at 782. However, the discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer. See *id.* at 782 ("Congress has not seen fit to permit the patenting of an old [composition], known to others..., by one who has discovered its...useful properties."); *Verdegaal Bros.*, 814 F.2d at 633.

This court's decision in *Titanium Metals* illustrates these principles. See *Titanium Metals*, 778 F.2d at 775. In *Titanium Metals*, the patent applicants sought a patent for a titanium alloy containing various ranges of nickel, molybdenum, iron, and titanium. The claims also required that the alloy be "characterized by good corrosion resistance in hot brine environments." *Titanium Metals*, 778 F.2d at 776. A prior art reference disclosed a titanium alloy falling within the claimed ranges, but did not disclose any corrosion-resistant properties. This court affirmed a decision of the PTO Board of Appeals finding the claimed invention unpatentable as anticipated. This court concluded that the claimed alloy was not novel, noting, "**it is immaterial, on the issue of their novelty, what inherent properties the alloys have or whether these applicants discovered certain inherent properties.**" *Id.* at 782 (emphasis added). This same reasoning holds true when it is not a property, but an ingredient, which is inherently contained in the prior art. The public remains free to make, use, or sell prior art compositions or processes, regardless of whether or not they understand their complete makeup or the underlying scientific principles which allow them to operate. The doctrine of anticipation by inherency, among other doctrines, enforces that basic principle." See *Atlas Powder Co. v. IRECO Inc.*, 51 USPQ2d 1943 (Fed. Cir. 1999).

Thus, a reference may be anticipatory if it discloses every limitation of the claimed invention either explicitly or inherently. A reference includes an inherent characteristic if that characteristic is the natural result flowing from the reference's explicitly explicated limitations. *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1269, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991).

As discussed above in the rejections under section 112, second paragraph, the claims do not require that each and every cell in the population have all four properties. Even if the claims were so amended, however, the cited prior art would still be anticipatory. In the instant case, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer all flow from the fact that the instantly claimed cells, like the cells described as being inherently present in the bone marrow of Hughes et al. by Rafii et al., may be obtained from bone marrow (see specification, page 37) and differentiate to both hematopoietic and endothelial lineages. Thus applicants are incorrect in arguing that the anticipatory rejection is improper.

Applicants have provided no evidence that, for example, the culturing steps at page 37 yield a cell population that is materially different from those discussed by Hughes et al. or Rafii et al. The mere fact that the bone marrow of Hughes et al. (according to Rafii et al.) comprises cells called "EPCs" and "HSCs" and the instant cells are not so called fails to distinguish the instant cells from the bone marrow of Hughes et al. The essence of *Titanium Metals* is that the inherent properties of a prior art product were all present at the time of the prior art. In *Titanium Metals*, the resistance to corrosion was inherently present in the alloy; in this case, the person of ordinary skill in the art would have a reasonable expectation that the four properties recited in instant claim 1 are inherently present in the bone marrow of Hughes et al., since the instantly described cell populations are obtainable from bone marrow.

Even if Rafii et al. were "uncertain" about the properties of bone marrow, as applicant alleges (Remarks, page 8), and even though Hughes et al. are silent as to the four properties in claim 1, the current claims would not be distinguished over the bone marrow of Hughes et al. in light of Rafii et al. M.P.E.P. § 2112 reads, "The claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable." Something that is old does not become patentable upon the discovery of a new property, use, or application. That is, even if applicant had discovered new properties (*i.e.*, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer) of the cells in the purified bone marrow of Hughes et al., the cells *per se* would not be patentable.

In *In re Swinehart* (439 F.2d 210, 212-13, 169 USPQ 226, 229 (CCPA 1971)), the CAFC noted that "where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied on." In *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594(CCPA 1980), the CAFC held that the burden of proof can be shifted to the applicant to show that the subject matter of the prior art does not possess the characteristic relied on whether the rejection is based on inherency under 35 U.S.C. § 102. See M.P.E.P. § 2184.

In this case, the instant cells are described as being obtainable from bone marrow, and the purified bone marrow of Hughes et al. (according to Rafii et al.) gives rise to both hematopoietic (differentiation of HSCs) and endothelial (differentiation of EPCs) cells. Therefore, the burden of proving novelty by way of substantive evidence is shifted to applicant.

Claims 1, 3, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Kraus et al. (2000, WO 00/11139; cited on IDS of 2/24/06). The claims are drawn to a composition comprising mammalian cells that give rise to both hematopoietic and endothelial lineages, said composition having numerous properties as recited in claim 1. In some dependent claims, the cells do not react with various markers. In some dependent claims, the cells are human. In some dependent claims, the cells are from a single clone.

Kraus et al. teach a population of cells isolated from human umbilical cord blood (Example 1) that give rise to both hematopoietic (Figure 8) and endothelial (Figure 7) cell types. Cord blood, and indeed the entire human body, arises from a single cell (the fertilized egg) and, as such, can be considered to be "cultured from a single clone" as required by claim 18.

The points made above regarding the rejection over Hughes et al. in light of Rafii et al. pertaining to inherency apply to this rejection as well. Whether the purified population of Kraus et al. was known before the instant invention to possess all four properties recited in claim 1 is immaterial on its own to the patentability of the

composition of Kraus et al. Something that is old does not become patentable upon the discovery of a new property, use, or application. That is, even if applicant had discovered new properties (*i.e.*, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer) of the cells of Kraus et al., the cells *per se* would not be patentable.

In the instant case, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer all flow from the fact that the instantly claimed cells, like the cells described by Kraus et al., differentiate to both hematopoietic and endothelial lineages (Figures 7 and 8).

Claims 1-4 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Scott et al. (2003, U:S. Patent Application Publication 2003/0180265; reference A). The claims are drawn to a composition comprising mammalian cells that give rise to both hematopoietic and endothelial lineages, said composition comprising cells that have at least one of four properties as recited in claim 1. In some dependent claims, the cells do not react with at least one of seven recited markers. In some dependent claims, the cells are human. In some dependent claims, the cells are from a single clone.

Scott et al. teach a clonal cell population that can make both blood (hematopoietic tissue) and blood vessels (endothelial tissue) (paragraph 0065). The

cells of Scott et al. may be isolated from mice (paragraph 0058) or from any other mammal, including humans (paragraph 0025).

The points made above regarding the rejection over Hughes et al. in light of Rafii et al. pertaining to inherency apply to this rejection as well. Whether the purified population of Scott et al. was known before the instant invention to possess all four properties recited in claim 1 is immaterial on its own to the patentability of the composition of Scott et al. Something that is old does not become patentable upon the discovery of a new property, use, or application. That is, even if applicant had discovered new properties (*i.e.*, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer) of the cells of Scott et al., the cells *per se* would not be patentable.

In the instant case, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer all flow from the fact that the instantly claimed cells, like the cells described by Scott et al., differentiate to both hematopoietic and endothelial lineages (paragraph 0065).

Claims 1-4 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Furcht et al. (2004, U.S. Patent Application Publication 2004/0107453; reference B). The claims are drawn to a composition comprising mammalian cells that give rise to both hematopoietic and endothelial lineages, said composition comprising cells that

have at least one of four properties as recited in claim 1. In some dependent claims, the cells do not react with at least one of seven recited markers. In some dependent claims, the cells are human. In some dependent claims, the cells are from a single clone.

Furcht et al. teach human multipotent adult stem cells (MASC), which are obtained from human bone marrow and do not express CD31, CD34, Tie, or CD62/P-selectin (Example 3; paragraphs 0110-0112). The MASCs of Furcht et al. can give rise to cells of multiple lineages, including hematopoietic cells (paragraphs 0029 and 0030; Example 7; paragraphs 166-168) and endothelial cells (paragraphs 0029 and 0030; Example 9; paragraphs 0126-0130; Figures 5-7). The MASCs of Furcht et al. do not cause teratomas when implanted into a recipient mammal (paragraph 0044).

The points made above regarding the rejection over Hughes et al. in light of Rafii et al. pertaining to inherency apply to this rejection as well. Whether the purified population of Furcht et al. was known before the instant invention to possess all four properties recited in claim 1 is immaterial on its own to the patentability of the composition of Furcht et al. Something that is old does not become patentable upon the discovery of a new property, use, or application. That is, even if applicant had discovered new properties (*i.e.*, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer) of the cells of Furcht et al., the cells *per se* would not be patentable.

In the instant case, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse;

and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer all flow from the fact that the instantly claimed cells, like the cells described by Furcht et al., differentiate to both hematopoietic and endothelial lineages (Examples 7 and 9, *inter alia*) and do not cause tumors when implanted into recipients (paragraph 0044).

Claims 1, 3, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Kraus et al. (2002, U.S. Patent 6,429,012; reference C). The claims are drawn to a composition comprising mammalian cells that give rise to both hematopoietic and endothelial lineages, said composition having numerous properties as recited in claim 1. In some dependent claims, the cells do not react with various markers. In some dependent claims, the cells are human. In some dependent claims, the cells are from a single clone.

Kraus et al. teach a population of cells isolated from human umbilical cord blood (Example 1) that give rise to both hematopoietic (Figure 8) and endothelial (Figure 7) cell types. Cord blood, and indeed the entire human body, arises from a single cell (the fertilized egg) and, as such, can be considered to be "cultured from a single clone" as required by claim 18.

The points made above regarding the rejection over Hughes et al. in light of Rafii et al. pertaining to inherency apply to this rejection as well. Whether the purified population of Kraus et al. was known before the instant invention to possess all four properties recited in claim 1 is immaterial on its own to the patentability of the composition of Kraus et al. Something that is old does not become patentable upon the

discovery of a new property, use, or application. That is, even if applicant had discovered new properties (*i.e.*, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer) of the cells of Kraus et al., the cells *per se* would not be patentable.

In the instant case, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer all flow from the fact that the instantly claimed cells, like the cells described by Kraus et al., differentiate to both hematopoietic and endothelial lineages (Figures 7 and 8).

Claims 1, 3, and 18 are rejected under 35 U.S.C. 102(a) as being anticipated by Miyajima et al. (2002, EP 1229116; cited on 2/24/06 IDS). The claims are drawn to a composition comprising mammalian cells that give rise to both hematopoietic and endothelial lineages, said composition comprising cells that have at least one of four properties as recited in claim 1. In some dependent claims, the cells do not react with at least one of seven recited markers. In some dependent claims, the cells are from a single clone.

Miyajima et al. teach cell fraction isolated from the aorta-gonad-mesonephros (AGM) region of mouse embryos (paragraphs 0085-0091) that can differentiate to both hematopoietic (paragraph 0116 and Table 1) and endothelial (paragraphs 0101-0103)

cell lineages. The entire embryo arises from a single cell (the fertilized egg) and, as such, can be considered to be "cultured from a single clone" as required by claim 18.

The points made above regarding the rejection over Hughes et al. in light of Rafii et al. pertaining to inherency apply to this rejection as well. Whether the purified population of Miyajima et al. was known before the instant invention to possess all four properties recited in claim 1 is immaterial on its own to the patentability of the composition of Miyajima et al. Something that is old does not become patentable upon the discovery of a new property, use, or application. That is, even if applicant had discovered new properties (*i.e.*, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer) of the cells of Miyajima et al., the cells *per se* would not be patentable.

In the instant case, the ability to proliferate in an *in vitro* culture for more than 40 generations; the inability to induce tumor formation in an immunodeficient Rag-1 mouse; and the inhibition from differentiation when cultured on a gelatinized, feeder-free layer all flow from the fact that the instantly claimed cells, like the cells described by Miyajima et al., differentiate to both hematopoietic and endothelial lineages (paragraphs 0101-0103 and 0116; Table 1).

No claims are allowed. No claims are free of the art.

Applicant should specifically point out the support for any amendments made to the disclosure in response to this Office action, including the claims (MPEP 714.02 and 2163.06). Due to the procedure outlined in MPEP § 2163.06 for interpreting claims, it is

noted that other art may be applicable under 35 U.S.C. § 102 or 35 U.S.C. § 103(a) once the aforementioned issue(s) is/are addressed.

Applicant is requested to provide a list of all copending U.S. applications that set forth similar subject matter to the present claims. A copy of such copending claims is requested in response to this Office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lora E. Barnhart whose telephone number is 571-272-1928. The examiner can normally be reached on Monday-Friday, 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lora E Barnhart

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SANDRA E. SAUCIER
PRIMARY EXAMINER